Problem 1:

Describe an algorithm for computing the union of two sets represented as ordered lists that runs in time proportional to the sum of their lengths.

Problem 2

A. Write the expression “(10+5)/((4*(1+2))-3)” in prefix notation.
B. Write the same expression in postfix notation.
C. Give a trace of the execution of the algorithm `evaluatePostfix` operating on your answer to (B) by stating each of the pushes and pops that occur.

Problem 3

(Modified from Weiss problem 2.11) An algorithm takes 0.5 msec for input size 100. How long will it take for input size 800, if the running time is the following (assume that lower-order terms are neglectible).

A. $O(\log_2(N))$
B. Linear
C. $O(N\log_2 N)$
D. Quadratic ($O(N^2)$)
E. Cubic ($O(N^3)$)

In parts A and C, you should round the logarithm upward to the next highest integer.

Problem 4

An algorithm takes 0.5 msec for input size 10. How long will it take for input size 20, if the running time is the following (assume that lower-order terms are negligible).

A. $O(2^N)$.
B. $O(4^N)$.

No Honors Problem